299-W22-25 (A7846)
Log Data Report

Borehole Information:

Borehole:		299-W22-25 (A7846)		Site:	216-S-9 Crib
Coordinates (WA St Plane)		GWL[1] (ft):	None	GWL Date:	09/17/07
North (m)	East (m)	Drill Date	TOC Elevation	Total Depth (ft)	Type
134404.621	567180.784	01/64	684.27 ft	335	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded Steel	2.7	4 5/8	4	5/16	2.7	195
Welded Steel	2.6	8 5/8	8	5/16	2.6	335

Borehole Notes:

The logging engineer measured the casing diameters with a caliper and steel tape. The 4-in. casing exists to 195 ft. Grout was emplaced in the annular space between the 4- and 8-in. casings. The borehole casing has been perforated from approximately 200 to 240 ft. A cement plug was placed at 249 ft. The borehole has apparently been filled to 240 ft which was the maximum depth achieved by the logging sonde. No water was observed in the borehole. A nearby borehole (299-W22-26) contained water at a log depth of 242 ft; approximately 2 ft below the maximum log depth in this borehole.

Logging Equipment Information:

Logging System:	Gamma 1 B		Type: / Serial No.:	SGLS HPGe (35%) / 36TP21095A
Effective Calibration Date:	05/25/07	Calibration Reference:	HGLP-CC-017	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Logging System:	Gamma 1 C		Type: / Serial No.:	HRLS planar HPGe / 39A314
Effective Calibration Date:	11/22/06	Calibration Reference:	HGLP-CC-004	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	3	4	5
Date	09/17/07	09/17/07	09/17/07	09/18/07	09/19/07
Logging Engineer	Spatz	Spatz	Spatz	Spatz	Spatz
Start Depth (ft)	100.0	62.0	31.0	185.0	240.0
Finish Depth (ft)	61.0	30.0	3.0	99.0	184.0
Count Time (sec)	200	20	200	200	200
Live/Real	R	R	R	R	R
Shield (Y/N)	N	N	N	N	N
MSA Interval (ft)	1.0	1.0	1.0	1.0	1.0
Pre-Verification	AB005CAB	AB005CAB	AB005CAB	AB006CAB	AB007CAB
Start File	AB005000	AB005040	AB005074	AB006000	AB007000
Finish File	AB005039	AB005073	AB005101	AB006086	AB007056
Post-Verification	AB005CAA	AB005CAA	AB005CAA	AB006CAA	AB007CAA
Depth Return Error (in.)	N/A	N/A	0	0	N/A

Log Run	1	2	3	4	5
Comments	No fine gain adjustment	No fine gain adjustment	No fine gain adjustment	No fine gain adjustment	No fine gain adjustment

Notes: Dead Time greater than 40 percent during log run 2 (20 second count time).

Log Run	6 Repeat				
Date	09/19/07				
Logging Engineer	Spatz				
Start Depth (ft)	228				
Finish Depth (ft)	204.0				
Count Time (sec)	200				
Live/Real	R				
Shield (Y/N)	N				
MSA Interval (ft)	1.0				
Pre-Verification	AB007CAB				
Start File	AB007057				
Finish File	AB007081				
Post-Verification	AB007CAA				
Depth Return Error (in.)	- 0.5				
Comments	No fine gain adjustment				

High Rate Logging System (HRL) Log Run Information:

Log Run	7	8	9 Repeat		
Date	09/20/07	09/24/07	09/24/07		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	63.0	53.0	35.0		
Finish Depth (ft)	52.0	31.0	32.0		
Count Time (sec)	300	300	300		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	1.0	1.0	0.5		
Pre-Verification	AC178CAB	AC179CAB	AC179CAB		
Start File	AC178000	AC179000	AC179023		
Finish File	AC178011	AC179022	AC179029		
Post-Verification	AC178CAA	AC179CAA	AC179CAA		
Depth Return Error (in.)	0	N/A	- 0.5		
Comments	No fine gain adjustment	No fine gain adjustment	No fine gain adjustment		

Logging Operation Notes:

Logging was conducted with no centralizer on the sonde. All measurements are referenced to top of casing.

Analysis Notes:

Analyst:	Henwood	Date:	03/12/08	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre- and post-run verifications for the logging system were performed before and after each day's data acquisition. The acceptance criteria were met.

A combined casing correction of 0.625-in.-thick (0.3125 + 0.3125 for the 4- and 8-in. casings) casing was applied to the SGLS data to 195 ft. Below 195 ft, a correction for 0.3125-in. thick casing was applied for the single 8-in. casing.

SGLS and HRLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with EXCEL worksheet templates identified as G1BMay07.xls and G1CNov06.xls for the SGLS and HRLS, respectively, using efficiency functions and corrections for casing, dead time, and water as determined from annual calibrations. HRLS data are substituted for SGLS data where the SGLS dead time exceeds approximately 40 percent.

Results and Interpretations:

Cs-137 was detected from 31 to 68 ft. The maximum Cs-137 concentration was measured at approximately 46,000 pCi/g at 33 ft. Cs-137 was also detected between 214 to 228 ft at concentrations less than 1 pCi/g. Other detections of Cs-137 near the MDL, using the routine processing software, were determined to be statistical fluctuations and are not valid full energy peaks.

Co-60 was detected at the lower margin (68 ft) of the high activity interval from 31 to 68 ft. This detection may suggest Co-60 also resides in the high activity zone. Other detections occur at approximately 129 ft and below 180 ft. Detections of Co-60 between 208 and 240 ft are at similar depth locations as Cs-137. Contamination in this interval could be casing related as historically contaminated water receded to the current level of approximately 242 ft log depth, leaving what some refer to as a "bathtub ring" on the casing. Co-60 concentrations are all below 1 pCi/g.

Repeat sections acquired for the logging system indicate good repeatability.

This borehole was logged with a NaI total gamma detection system by Pacific Northwest Laboratory in 1986. Generally, the contaminant profiles are similar except where the Co-60 profile indicates significant decay during the last 21 years.

List of Log Plots:

Depth Reference is top of casing

Manmade Radionuclides (2 pages)
Natural Gamma Logs (2 pages)
Combination Plot (2 pages)
Combination Plot (0 to 240 ft)
Total Gamma & Dead Time (0 to 240 ft)
Repeat of Manmade Radionuclides
Repeat Section of Natural Gamma Logs

[1] GWL – groundwater level

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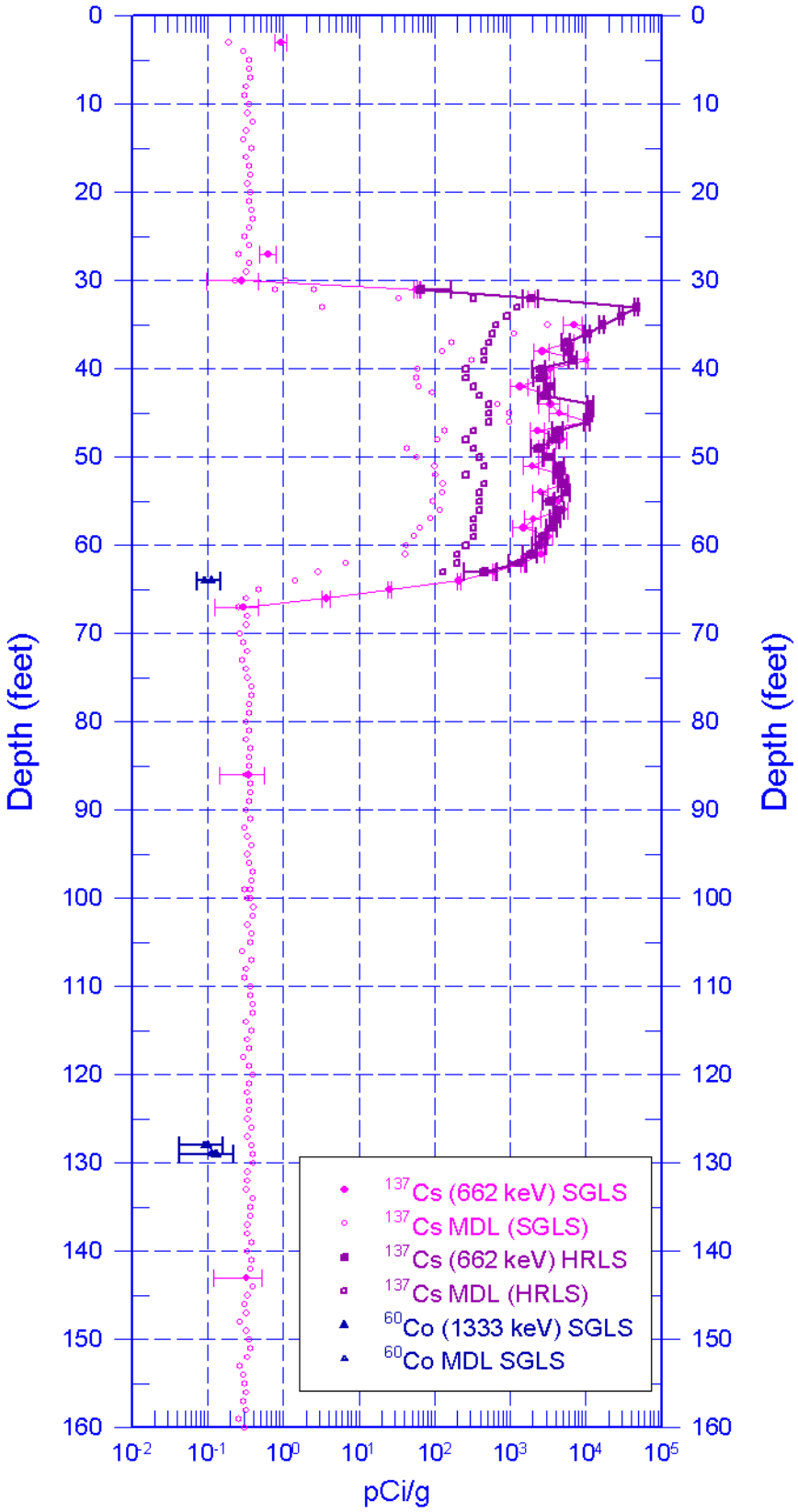
Man-Made Radionuclides



Zero Reference = Top of Casing

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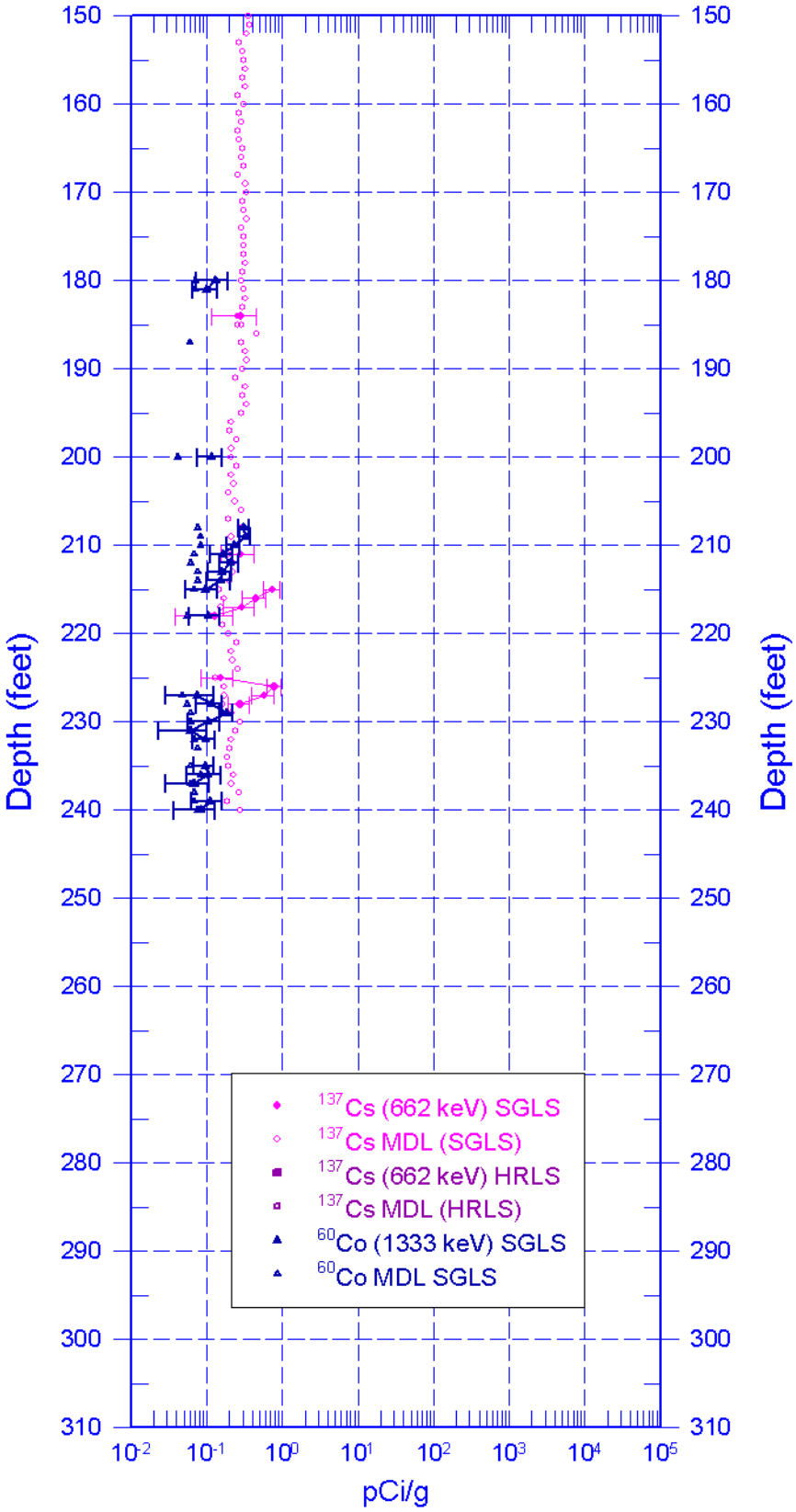
Man-Made Radionuclides



Zero Reference = Top of Casing

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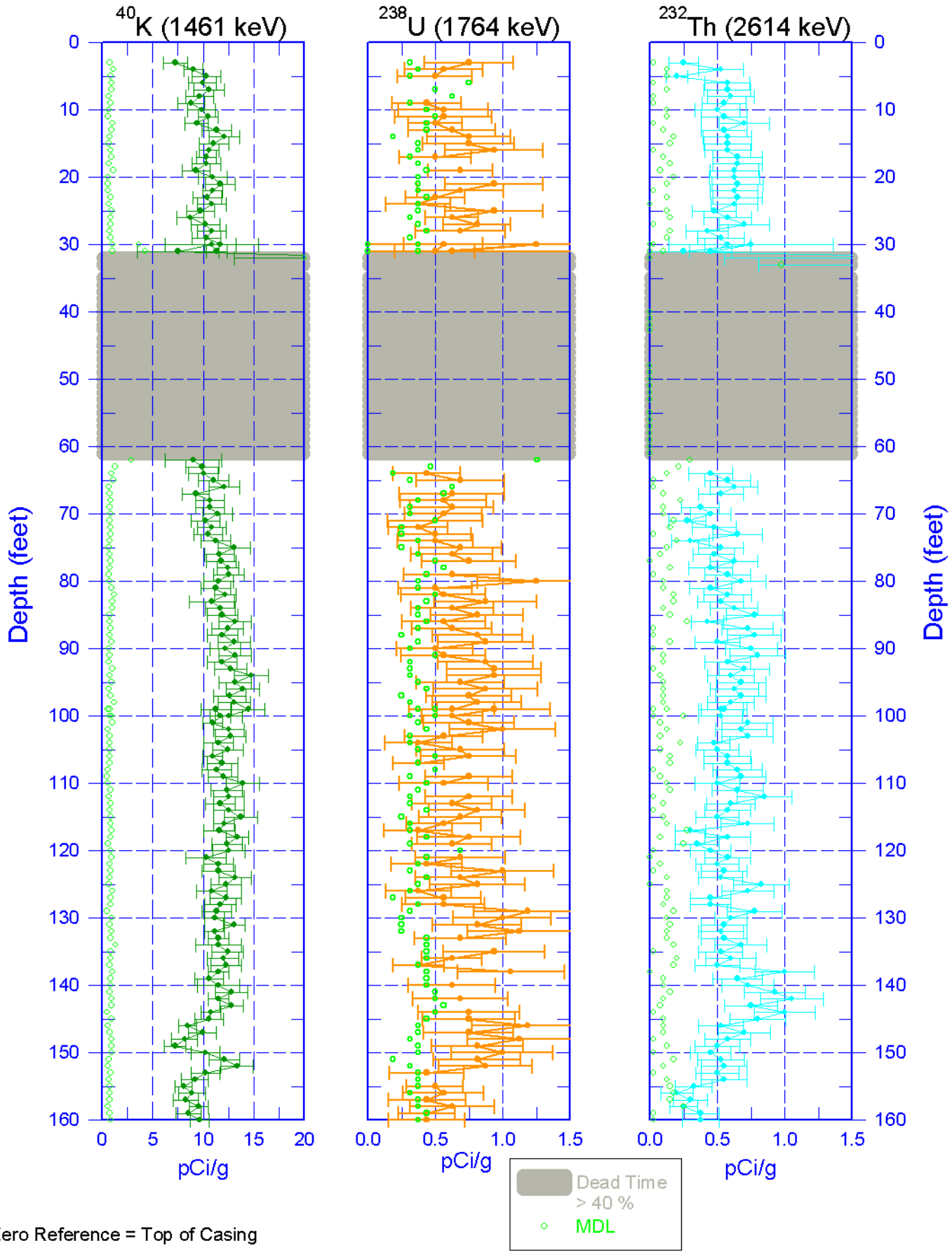
299-W22-25 (A7846)
Natural Gamma Logs



Zero Reference = Top of Casing

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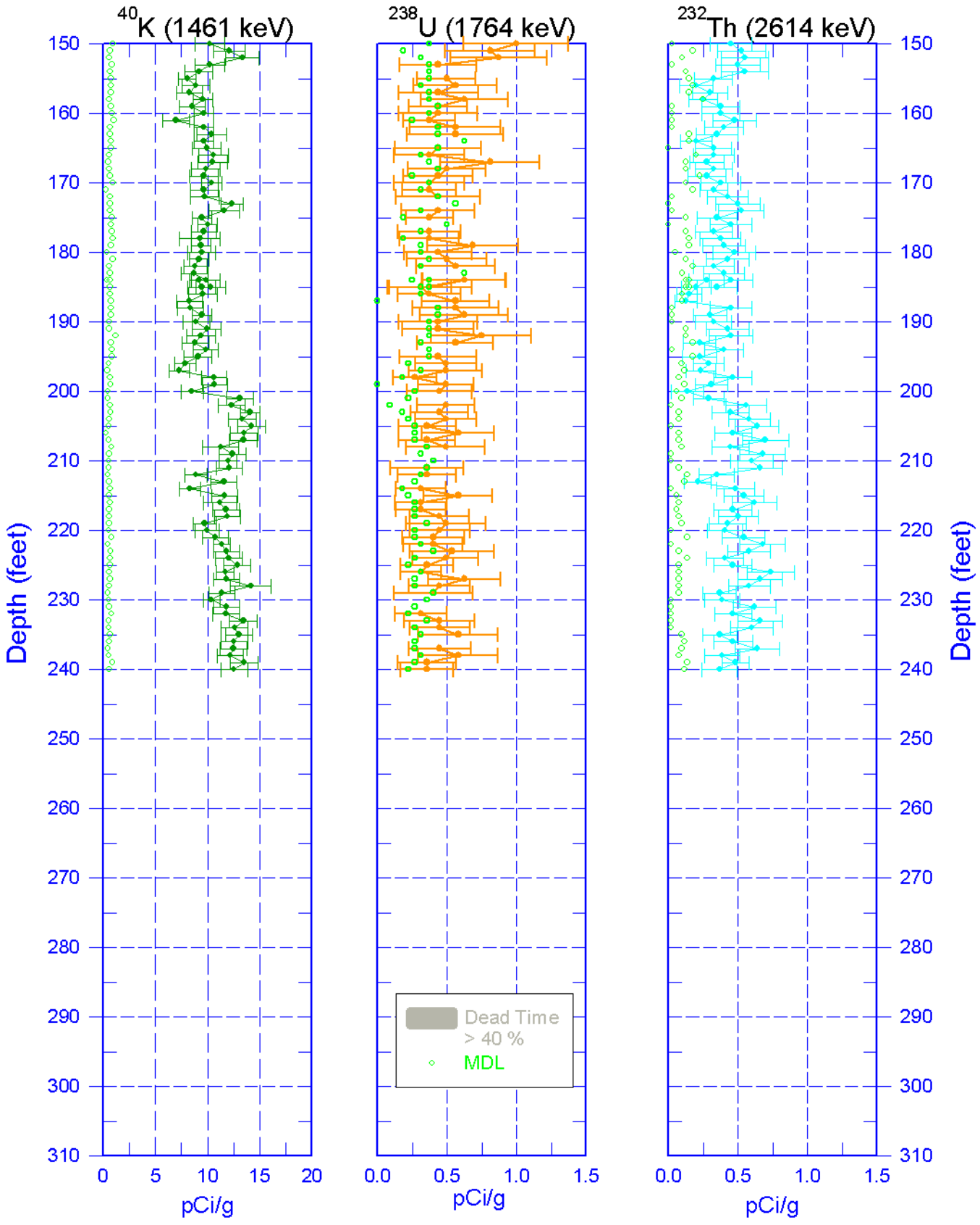
299-W22-25 (A7846)
Natural Gamma Logs



Zero Reference = Top of Casing

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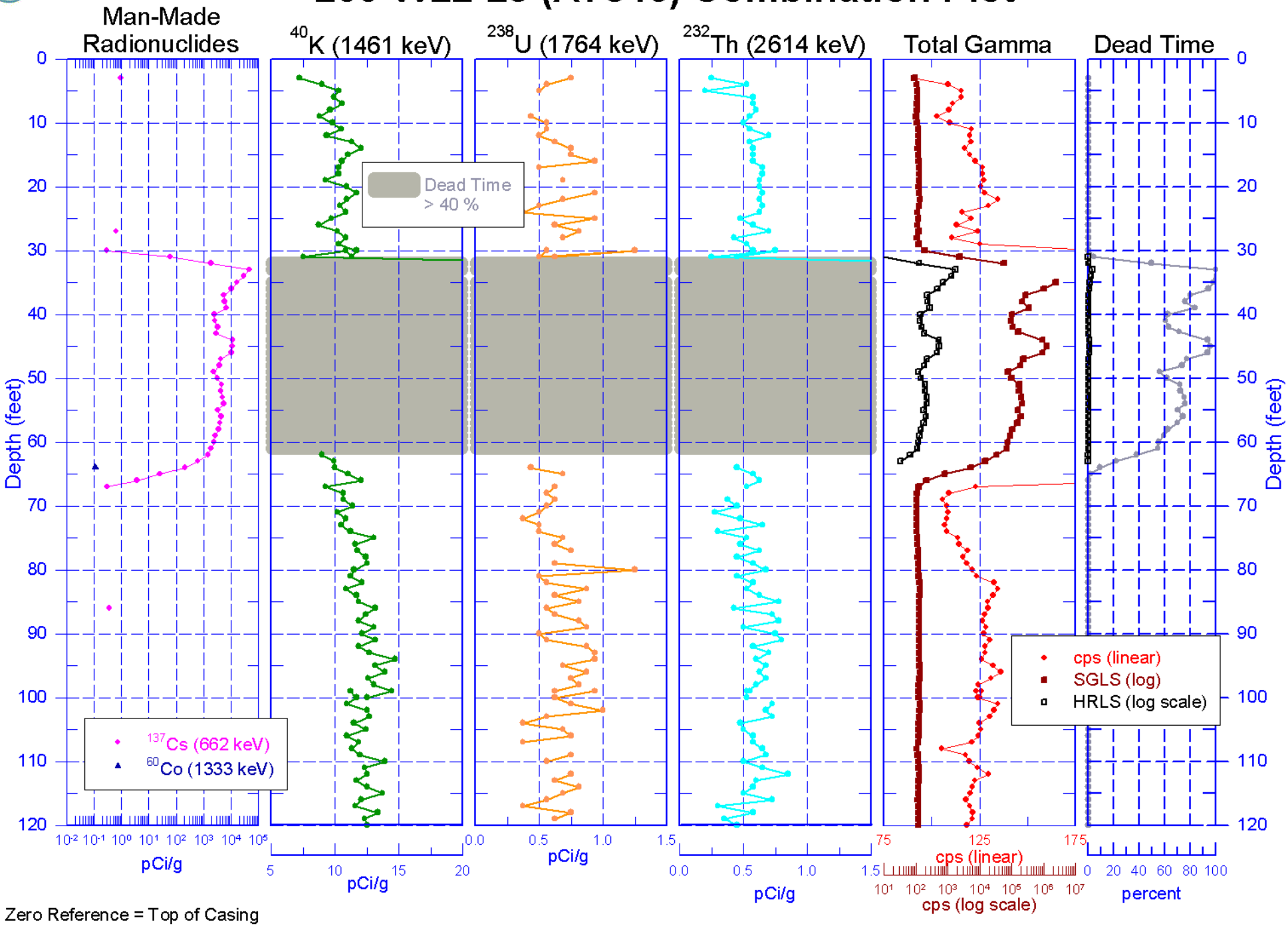
299-W22-25 (A7846) Combination Plot



Zero Reference = Top of Casing

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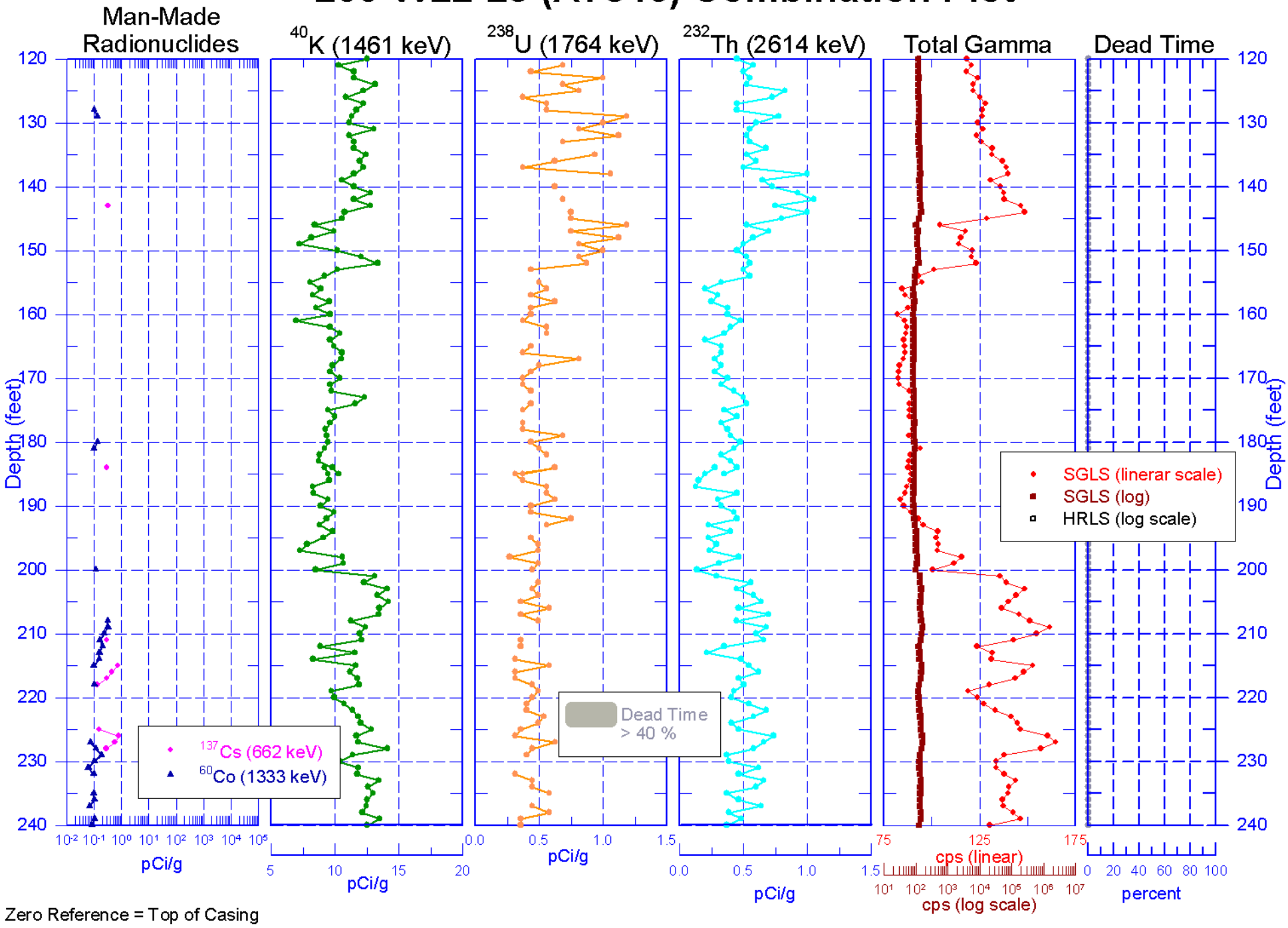
299-W22-25 (A7846) Combination Plot



Zero Reference = Top of Casing

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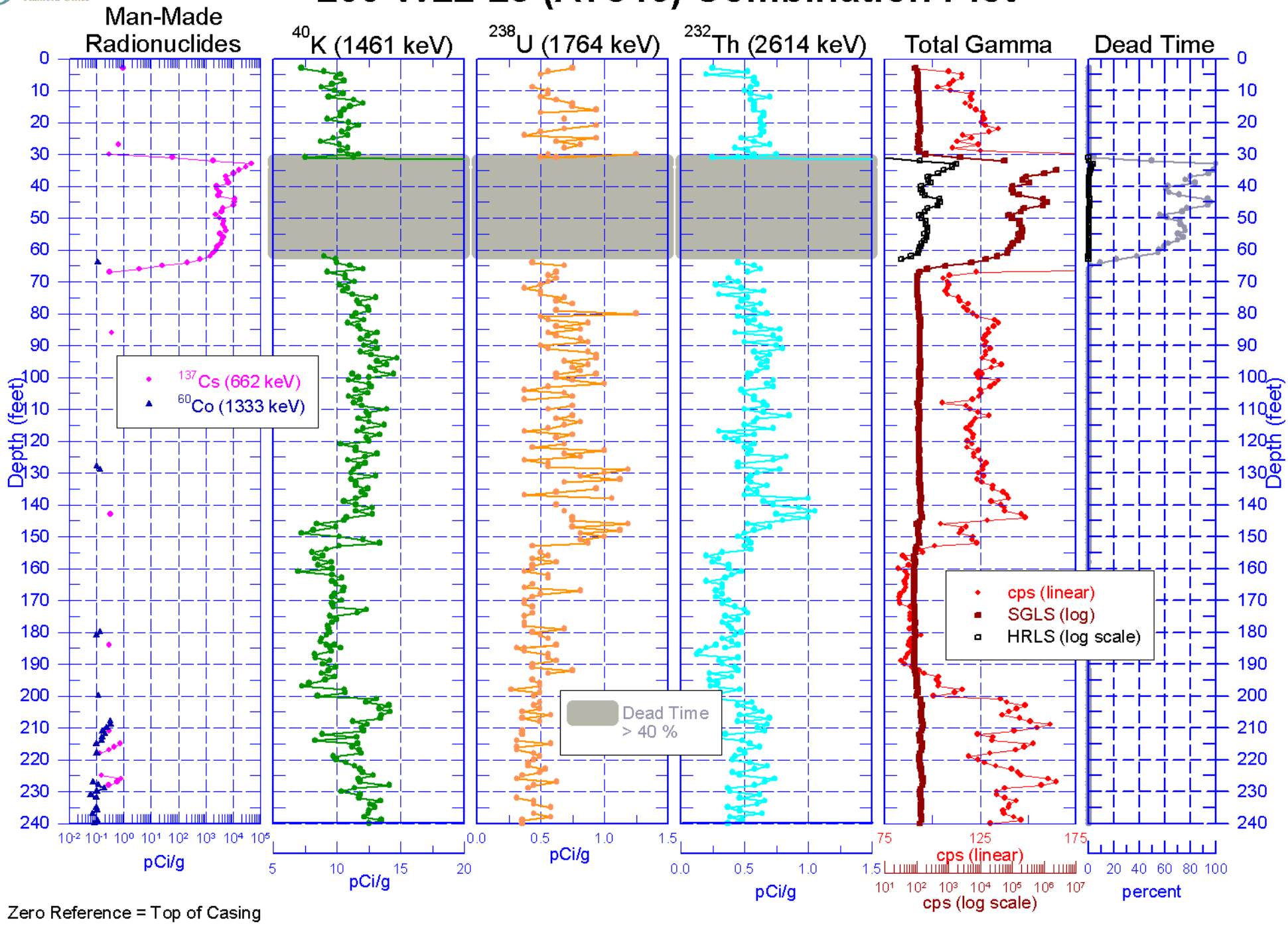
299-W22-25 (A7846) Combination Plot



Zero Reference = Top of Casing

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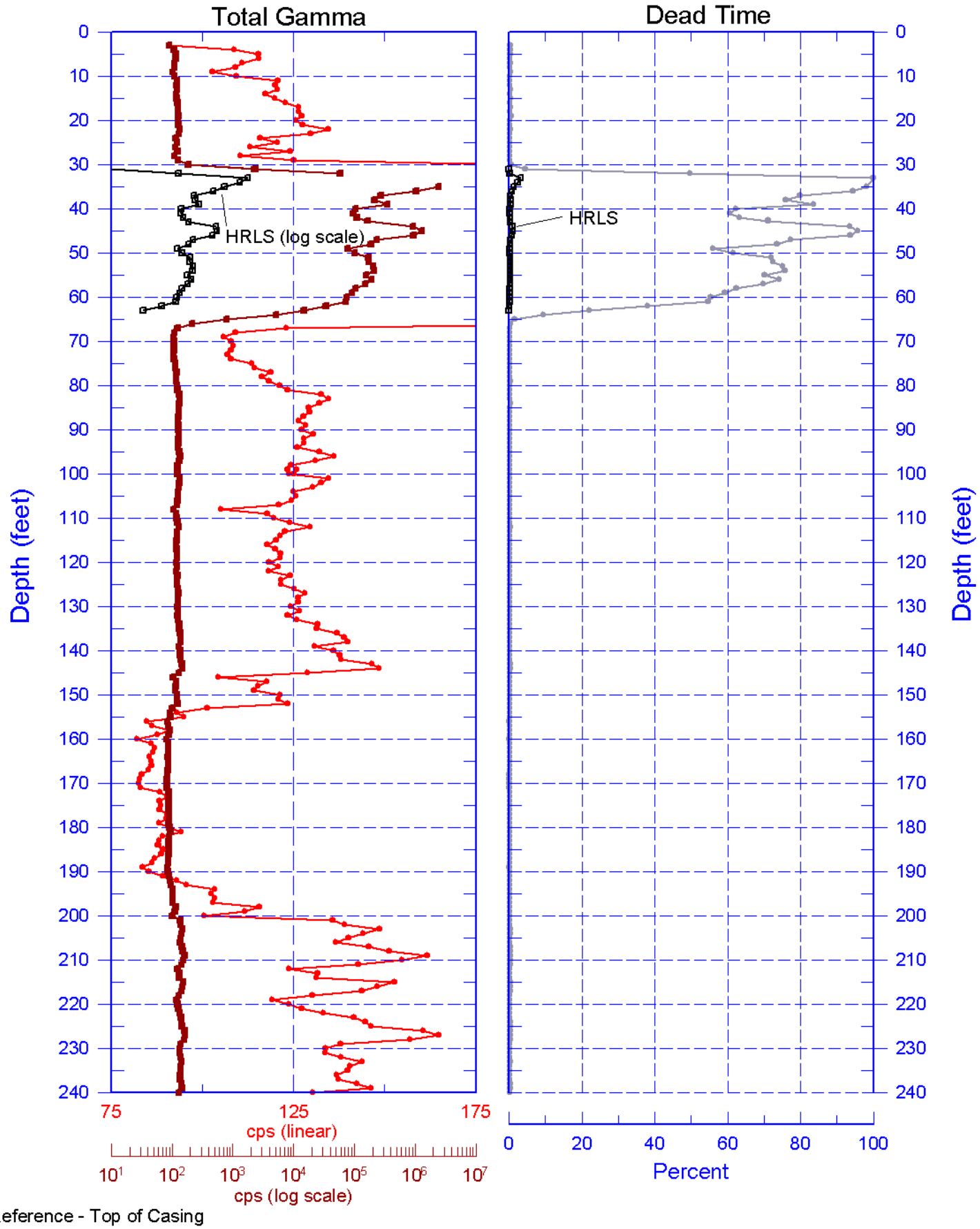
299-W22-25 (A7846)
Total Gamma & Dead Time



Reference - Top of Casing

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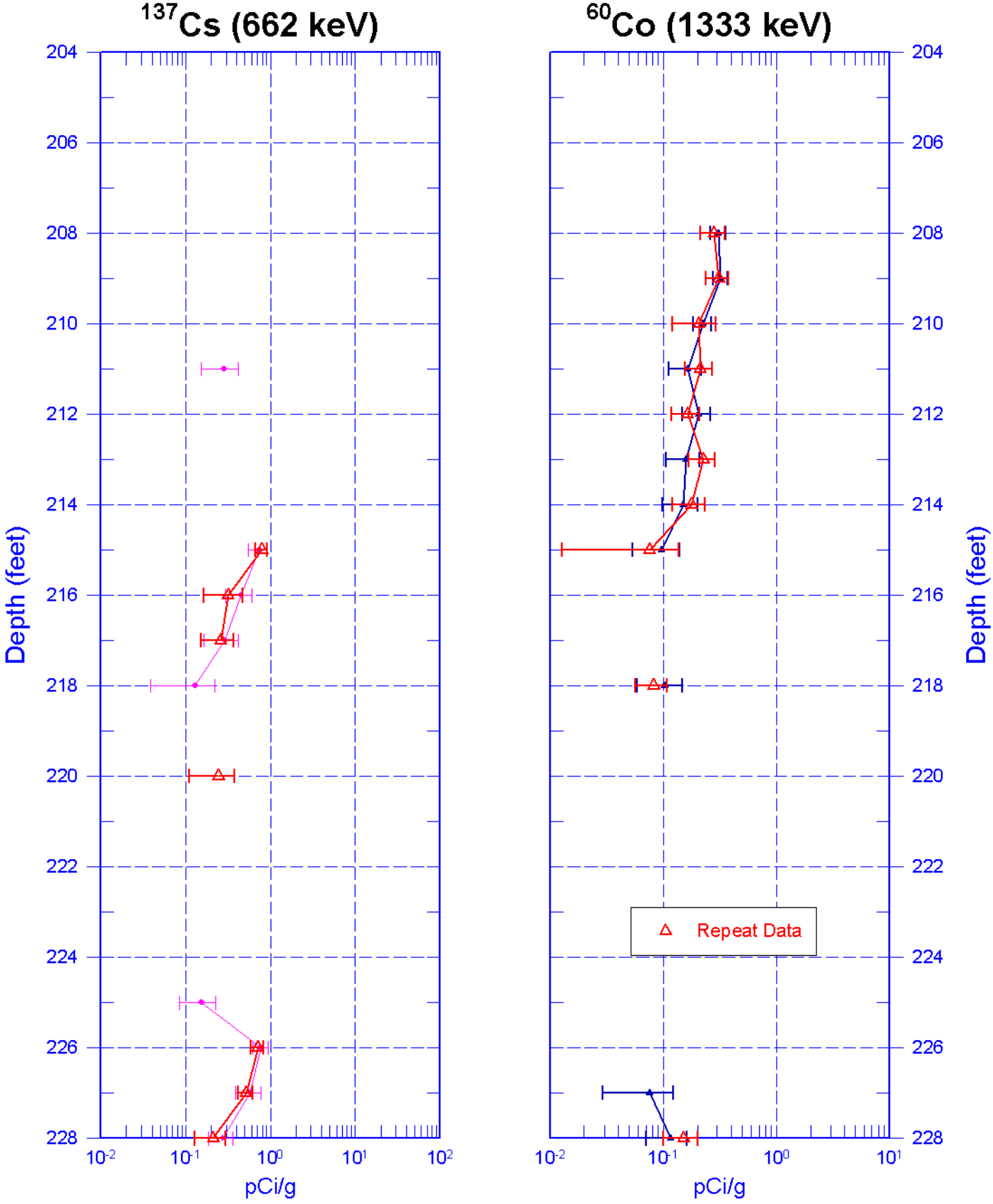
Repeat of Manmade Radionuclides



Zero Reference = Top of Casing

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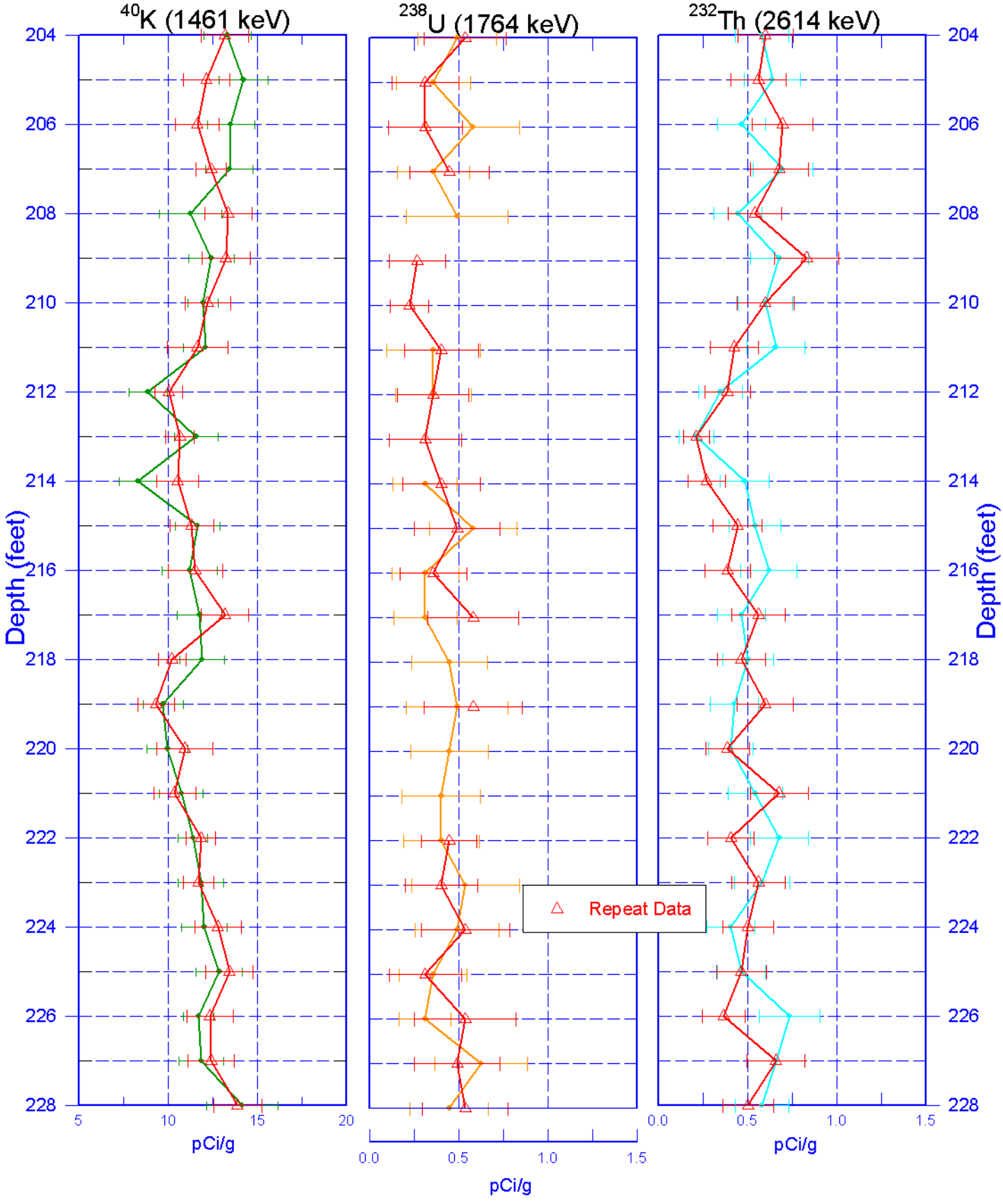
299-W22-25 (A8846)

Repeat Section of Natural Gamma Logs



Zero Reference = Top of Casing